

## CLAIM AMENDMENTS

Claims 1 to 13. (canceled)

14. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

a) irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being equal to or greater than  $30^\circ$ ; and

b) irradiating, after step a), the solid surface with the gas cluster ion beam with the irradiation angle being less than  $30^\circ$ .

15. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

a) irradiating the solid surface with the gas cluster ion beam with a first irradiation angle between the solid surface and the gas cluster ion beam being less than  $30^\circ$ ;

b) irradiating the solid surface with the gas cluster ion beam with a second irradiation angle between the solid surface and the gas cluster ion beam being equal to or greater than  $30^\circ$ ; and

c) repeating one or more times a continuous change of an irradiation angle between the first irradiation angle and the second irradiation angle while irradiating the solid surface with the gas cluster ion beam.

16. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

a) irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than  $30^\circ$  so that an orthographically-projected direction defined by projecting an incident direction of the gas cluster ion beam onto the solid surface accords with a first direction; and

b) irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than  $30^\circ$  so that the orthographically-projected direction accords with a second direction different from the first direction.

17. (new) The method of Claim 16 comprising varying the orthographically-projected direction continuously back and forth between the first direction and the second direction while irradiating the solid surface with the gas cluster ion beam.

18. (new) The method according to Claim 17, wherein the irradiation angle between the gas cluster ion beam and the solid surface is fixed during step a).

19. (new) The method of Claim 16, wherein the second direction is 5° or more away from the first direction.

20. (new) The method according to Claim 19, wherein the irradiation angle between the gas cluster ion beam and the solid surface is fixed during step a).

21. (new) The method according to any one of Claims 14, 15, 17 and 19, wherein the solid surface is a side wall surface of a concave structure or a convex structure.

22. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:  
a step of irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than 30° for at least a portion of a time period of gas cluster ion beam irradiation so that the solid after irradiation has a thickness greater than or equal to 10 nm.

23. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:  
a step of irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than 30° for at least a portion of a time period of a gas cluster ion beam irradiation,  
wherein the solid is chromium, platinum, nickel, silicon or silicon dioxide.

24. (new) A method of smoothing a solid surface with a gas cluster ion beam, comprising:  
a step of irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than 30° for at least a portion of a time period of a gas cluster ion beam irradiation,  
wherein the solid is a thermal oxide film formed on a substrate.